

Heated Thermoplastic Fiber Placement Head for NASA Langley Research Center, Phase II

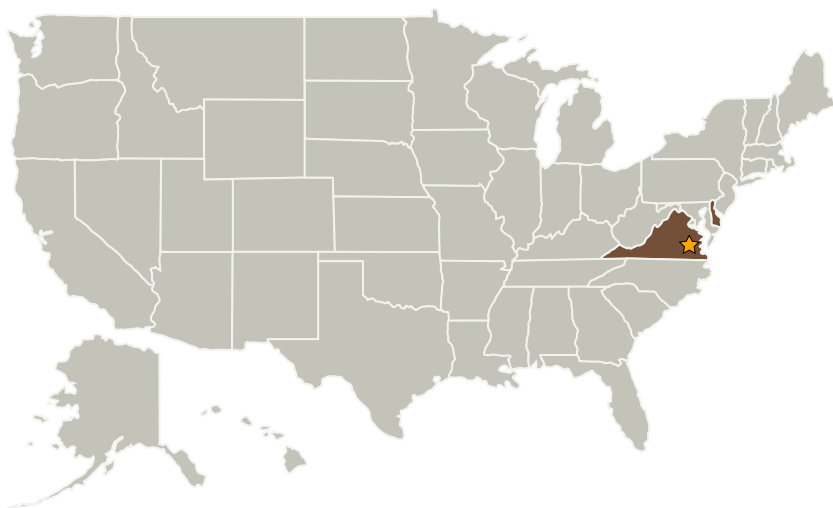
Completed Technology Project (2004 - 2006)



Project Introduction

Reduced-mass polymer composite materials are crucial to the success of aerospace systems for reducing vehicle weight. But, composite material adoption is inhibited because the autoclave consolidation required is prohibitively expensive for the large tanks and skins contemplated in the Next Generation Launch Technology (NGLT) Program. To remedy this, NASA-LaRC has been developing cost-effective, lightweight, high-performance thermoplastic composite materials for years. These materials have the potential to dramatically reduce the cost of large aerospace structures, because they allow processing without resorting to hugely expensive autoclaves. Unfortunately, NASA lacks a robust, cost-effective fabrication process to tape-place these emerging materials into laminates and to build contoured structure, and thus can't evaluate usefulness of NASA materials. This SBIR II program fabricates for NASA-LaRC the automated deposition head successfully designed in the recent SBIR I to complete the tape placement process and in situ consolidation without an autoclave. The composite deposition head, creel, and associated machine and process control system Accudyne will build in Phase II is designed to operate on NASA-LaRC's tape layer. Automated deposition heads can later be sold to industrial companies for existing tape layers and placement machines so that industry can benefit from NASA composite materials by using out-of-the-autoclave thermoplastic tape placement.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---------------------------------|-------------------------|-------------|-------------------|
| ★ Langley Research Center(LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| Accudyne Systems, Inc. | Supporting Organization | Industry | Newark, Delaware |

| Primary U.S. Work Locations | |
|-----------------------------|----------|
| Delaware | Virginia |

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes